Specifications

■ LB-DH7 Series Data Archiver*[1]

Product name	Base module	Bottom module	Extension module (without writer unit)	Extension module (with writer unit)
Model No.	LB-DH70A0G	LB-DF81Z1G	LB-DH82Z1G	LB-DF72A0G

	Minimum configuration	Maximum configuration (per rack)
Number of mountable magazines	152	532
Capacity*[2]	0.5 PB	1.9 PB
Number of writer units (per rack)	2 units	6 units
Total data transfer rate*[3]	Max. 360 MB/s	Max. 1080 MB/s
Host interface	SAS/iSCSI/FC (by server for Data Archiver control software)	
Command protocol	SCSI (MMC, SMC)	
When mounted in a 19-inch rack, with EIA panels (height)	16U	46U
Input power	DC +24V, +12V	

*1: The system requires a separately sold server (Data Archiver control software installation necessary) and external power supply.
*2: After physical formatting. When using RAID 0.
*3: Unit measurement value obtained by a Panasonic standard test. Actual writing speed varies depending on environmental conditions, such as the server.

■ Data Archiver Magazine (Optional)

Model No.	LM-BM36XB	LM-BM12LB
Recording capacity	3.6 TB (with 12 300-GB Archival Discs)	1.2 TB (with 12 100-GB Blu-ray Discs™)

■ Data Archiver Manager (Optional)

Supported OS	Red Hat Enterprise Linux7, CentOS7
Interfaces	REST API (SWIFT, S3) NAS (NFS, CIFS)

■ Dedicated SAS Cables (Optional)

Product Name	Straight SAS Cable (2.5 m)	Branch SAS Cable (2.5 m)	Straight SAS Cable (2.0 m)	Branch SAS Cable (2.0 m)
Model Number	LB-XA25A0G	LB-XA25B0G	LB-XA20A0G	LB-XA20B0G

* These cables are used to connect the Data Archiver and server (Data Archiver control software installation necessary).
  Please purchase the cables to suit the system configuration.

• Data capacity indicated in the text is based on 1 TB = 10^{12} bytes and data in unformatted condition.
• Product ratings and designs are subject to change for modification and improvement without prior notice.
• Note that Panasonic does not guarantee against damage or malfunctions during the product life.

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Panasonic Corporation
Connected Solutions Company
Storage Business Development Center

SP-CLDH7_2

Panasonic
BUSINESS

Data Archiver
LB-DH7 Series
Made-to-order product

**Scalable Optical Disc Library
for Long-Term Archiving of Ever-Increasing Data**

◆ freeze-ray®

* The photo shows an image of a data center with rear product images.

A new-generation optical disc data archiving system contributing to reliable, long-term storage of large-volume data and reduction of costs (TCO).

Revolutionary information asset archiver

Panasonic's "freeze-ray" Series Data Archiver is a large-capacity optical library system designed to meet the needs of large-scale data centers and other applications in the IT industry. Boasting the following features, the freeze-ray system stores digital data safely at low cost, helping to create new business opportunities, preserve cultural assets, and advance academic research.

freeze-ray®

* The photo shows a front product image stored in a rack.

Large capacity, scalability	• Maximum storage capacity of 1.9 petabytes (PB) per standard 19-inch rack. • Scalable modular structure allows flexible system configuration.
High reliability	• Contactless media ensures high reliability in repetitive data read/write operations and prevents data loss. • Resists the effects of humidity, temperature, light and age-related degradation. • WORM (Write Once Read Many) media physically prevents overwriting to guarantee data authenticity. • RAID technology safeguards stored data from unexpected problems.
Reduction of costs (TCO)	• Optical discs with a lifetime of 100 years* reduce the cost of periodic data migration. • No need for constant power supply and air conditioning reduces electricity cost and CO_2 emissions.

*The estimated lifetime based on acceleration tests that are being conducted by Panasonic. Note that it is not a guaranteed value.

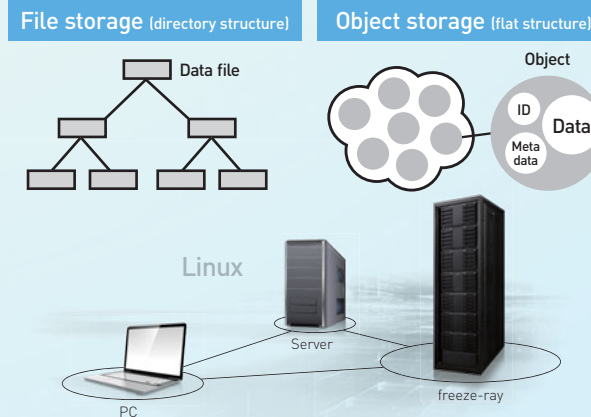## Scalable modular structure, smart data management

Scalable structure

The minimum configuration includes one bottom module, one base module and one extension module (with writer unit). The base module can be mounted with 76 3.6-TB magazines for a total of 273.6 TB. When mounted with seven modules (maximum) per 19-inch rack, the system achieves a large storage capacity of 1.9 PB (with RAID 0) at low bit cost. Also, the total data transfer rate reaches 360 to 1080 MB/s*[1] by adding 6 extension modules with writer units. This can be flexibly designed to meet the user's needs.

*1 Unit measurement value obtained by a Panasonic standard test. Actual writing speed varies depending on environmental conditions, such as the server.

- Disc carrier
- Drive system
- Magazine carrier
- Base module
- External power supply*[2]
- Data Archiver Magazine (optional)
- Server*[2] [Data Archiver control software installation necessary]

*2 Sold separately (rack installation also possible).

Smart data management

When the dedicated software, Data Archiver Manager (optional), is used, freeze-ray can be easily connected to an existing IT system via LAN. Since multiple freeze-ray units and all magazines can be managed as one namespace, data can be accessed intuitively without having to know which magazine has the target files. The freeze-ray system supports Linux, so it is possible to construct an object storage system suitable for archiving a large volume of unstructured data.
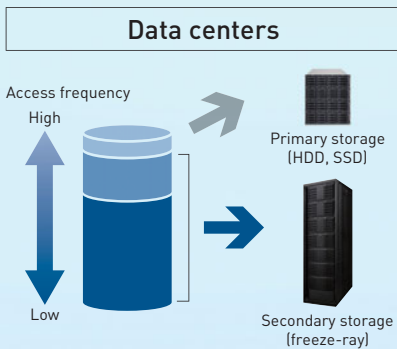
File storage (directory structure)
Data file

Object storage (flat structure)
Object — ID, Data, Meta data

Linux

PC — Server — freeze-ray

Optical disc technology evolved for enterprise applications

Large-capacity, professional optical discs housed in a magazine

Optical discs have evolved over the past 30 years or so, and are now advancing into low-cost media for archiving fast-growing digital data. Panasonic has formulated the "Archival Disc,*" a new standard for enterprise-use optical discs. The freeze-ray Data Archiver uses the Archival Disc with a storage capacity of 300 GB per disc to enable the maximum storage of 1.9-PB per standard 19-inch rack. Panasonic plans to further densify Archival Discs in the near future and promote their use in large-scale, multi-petabyte data archiving devices.

About the Archival Disc

Blu-ray Disc™ → Archival Disc
• Double-sided disc structure
• Increased recording density
• Recording layer with higher reliability

* The Archival Disc is a professional-use optical disc standard developed jointly with Sony Corporation.

3.6 TB
Contains 12 300-GB Archival Discs

Large-capacity data archiver to meet a diversity of applications

Data centers

Access frequency
High / Low

Primary storage (HDD, SSD)
Secondary storage (freeze-ray)

[Issue] Increased data volume is causing a rapid rise in backup costs.

[Solution] Separate data with low access frequency from the existing backup environment, and transfer it to the freeze-ray secondary storage system.
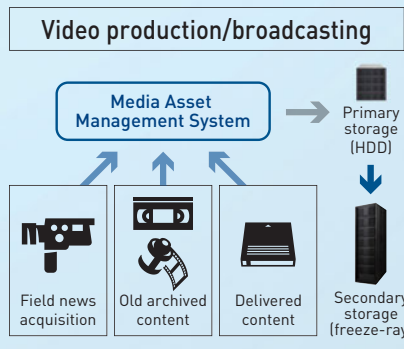
[Result] Optimizes the operating costs of the entire storage system.

Research organizations

All experimental data
Main storage (HDD)
Sub-storage (freeze-ray)
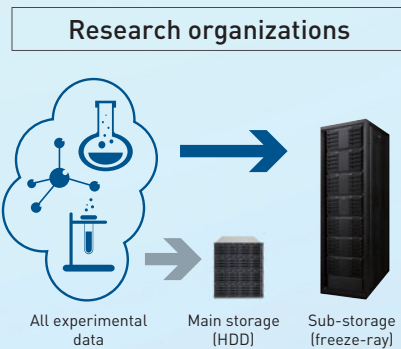
[Issue] Experimental data must be collected, stored and shared on a daily basis. When the main storage has a problem, past data cannot be accessed.

[Solution] Store all data in the large-capacity freeze-ray system. If the main storage malfunctions, switch the data providing source to the freeze-ray.

[Result] Uninterrupted data sharing service. Achieve high-speed random access.

Video production/broadcasting

Media Asset Management System
Primary storage (HDD)

Field news acquisition
Old archived content
Delivered content
Secondary storage (freeze-ray)

[Issue] There is a need for reliable, long-term storage of digitally converted video assets with an online/cloud solution.

[Solution] Migrate existing video and data tapes to freeze-ray synchronized with Media Asset Management and an online/cloud solution.

[Result] Passes down valuable video assets to the next generation. Off-line shelf control magazines also possible.